* NOTICES *

CLAIMS

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(57) [Claim(s)]
[Claim 1] A booster amplifier (5), The antenna pattern (4) which is perpendicularly extended to the antenna pattern (2) which has a level stripe portion and receives the signal of AM band and the signal of FM band, and the above-mentioned level stripe portion, and receives the frequency more than FM band is prepared on the glass (1) side of the aperture of an automobile. A booster amplifier (5) is equipped with the input line (A) from the filter of the frequency of amplifier and FM band, and an antenna pattern (2), and the input line (C) from an antenna pattern (4). The above-mentioned amplifier is equipped with the transistor (91) and transistor (98) which are connected in parallel. the above-mentioned filter The series-connection circuit of the capacity (87) and capacity (88) which are connected between an input line (A) and the base of a transistor (91), It has the coil (89) connected between the middle node of capacity (87) and capacity (88), and grounding. further and the above-mentioned filter The series-connection circuit of the capacity (94) and capacity (95) which are connected between an input line (C) and the base of a transistor (98), and the glass antenna characterized by having the coil (96) connected between the middle node of capacity (94) and capacity (95), and grounding. [Claim 2] A booster amplifier (5), The antenna pattern (4) which is perpendicularly extended to the antenna pattern (2) which has a level stripe portion and receives the signal of AM band and the signal of FM band, and the above-mentioned level stripe portion, and receives the frequency more than FM band is prepared on the glass (1) side of the aperture of an automobile. A booster amplifier (5) The filter of the frequency of amplifier and FM band, the filter of the frequency more than FM band, It has an input line (A) from an antenna pattern (2), and an input line (C) from an antenna pattern (4). the above-mentioned amplifier It has the transistor (108) by which resistance (107) is connected between a collector and the base. the filter of the frequency of the above-mentioned FM band Connect between an input line (A) and the base of a transistor (108). The series-connection circuit of a coil (103), capacity (104), and capacity (105), It has the coil (106) connected between the middle node of capacity (104) and capacity (105), and grounding. and the filter of the frequency more than the above-mentioned FM band Connect between an input line (C) and the base of a transistor (108). The series-connection circuit of capacity (113) and capacity (114), and the glass antenna characterized by having the coil (115) connected between the middle node of capacity (113) and capacity (114), and grounding.

[Translation done.]

* NOTICES *

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] this invention relates to the glass antenna using the antenna pattern by the conductor on a glass side.
[0002]
[Description of the Prior Art] The conventional glass antenna is shown in drawing 7 . (118) Rear glass of ******** (119), The antenna pattern by the conductor and (120) are defogger patterns. A defogger pattern is a cable (123) and a coil (124) about the electrode terminal formed in the side edge section of a glass side (125). It lets it pass, connects with a power supply, and is capacity (126) between a power supply VDD and Grounding GND. It has connected. An antenna pattern is the booster amplifier (121) which equipped the signal terminal of the side edge section of a glass side near rear glass similarly. It connects and is a cable (122) from a booster amplifier. It lets it pass and the output signal X is taken out. Similarly a power supply VPP and Grounding GND are supplied to the booster amplifier by the cable.
[0003] The composition of the conventional booster amplifier is shown in drawing 8 . For AM band, about the signal included in the input terminal I, amplifier (131) and FM band are amplifier (139). It amplified and compounded and the output signal X is taken out. (129) , (130) The amplifier (137) of AM band and (138) are each bias resistance of the amplifier of FM band. Capacity (127) and coil (128) (135) A series connection is an input filter which lets AM band component of Signal I pass to amplifier, and is capacity (134). It is a coil (136) between the middle terminal of a series connection, and grounding. The connected input filter is amplifier (139) about the component of FM band. It lets it pass. The amplifier output of AM band is capacity (132) and a coil (133). The amplifier output of through and FM band is capacity (140) about the output filter which consists of a series connection. It is led to an end child through the output filter to depend, and has become an output signal X. Coil to which a power supply VPP is led (142) Stabilization capacity (141) The power supply filter is constituted.
[0004]
[Problem(s) to be Solved by the Invention] This conventional glass antenna had problems, like connection of the lead wire of a signal and the composition of a booster amplifier become complicated, when it was going to acquire the signal from two or more antenna patterns, in order to produce a sensitivity fall and change and to raise a receiving performance, if the lead wire from the signal terminal of an antenna pattern to a booster amplifier is long and leading about changes.
[0005]
[Means for Solving the Problem] this invention A booster amplifier (5), The antenna pattern (4) which is perpendicularly extended to the antenna pattern (2) which has a level stripe portion and receives the signal of AM band and the signal of FM band, and the above-mentioned level stripe portion, and receives the frequency more than FM band is prepared on the glass (1) side of the aperture of an automobile. A booster amplifier (5) is equipped with the input line (A) from the filter of the frequency of amplifier and FM band, and an antenna pattern (2), and the input line (C) from an antenna pattern (4). The above-mentioned amplifier is equipped with the transistor (91) and transistor (98) which are connected in parallel. the above-mentioned filter The series-connection circuit of the capacity (87) and capacity (88) which are connected between an input line (A) and the base of a transistor (91), It has the coil (89) connected between the middle node of capacity (87) and capacity (88), and grounding. further and the above-mentioned filter The glass antenna characterized by having the coil (96) connected between the series-connection circuit of the capacity (94) and capacity (95) which are connected between an input line (C) and the base of a transistor (98) and the middle node of capacity (94) and capacity (95), and grounding is offered. Moreover, a booster amplifier (5), The antenna pattern (4) which is perpendicularly extended to the antenna pattern (2) which has a level stripe portion and receives the signal of AM band and the signal of FM band, and the above-mentioned level stripe portion, and receives the frequency more

than FM band is prepared on the glass (1) side of the aperture of an automobile. A booster amplifier (5) The filter of the frequency of amplifier and FM band, the filter of the frequency more than FM band, It has an input line (A) from an antenna pattern (2), and an input line (C) from an antenna pattern (4). the above-mentioned amplifier It has the transistor (108) by which resistance (107) is connected between a collector and the base. the filter of the frequency of the above-mentioned FM band Connect between an input line (A) and the base of a transistor (108). The series-connection circuit of a coil (103), capacity (104), and capacity (105), It has the coil (106) connected between the middle node of capacity (104) and capacity (105), and grounding. and the filter of the frequency more than the above-mentioned FM band Connect between an input line (C) and the base of a transistor (108). The glass antenna characterized by having the coil (115) connected between the series-connection circuit of capacity (113) and capacity (114) and the middle node of capacity (113) and capacity (114), and grounding is offered. [0006] the case where the signal from two or more antenna patterns is compounded with an input filter -- the input from one antenna pattern -- receiving -- the input from another antenna pattern -- a coil -- and -- or it connects through the filter using capacity, or compounds through the filter according to the signal kind of each antenna pattern The input filter has each filter of the signal of AM band, and the signal of the frequency more than FM band, or two or more filters of this band.
[0007] between the output sides of a transistor and power supplies to which amplifier amplifies a signal -- a coil -- and -- or it had the load of resistance, and it let direct and the follower pass and the output signal is taken out from the outputting point of this transistor When compounding with amplifier, parallel connection of the transistor is carried out using a load as common, the signal from an antenna pattern is inputted into each transistor through a filter, and it compounds by the transistor amplifying circuit.
[0008] Drawing 1 is the block diagram of the glass antenna of this invention. (1) ** glass and (2) It is the antenna pattern which has the pattern of the level stripe by the conductor, and they are AM band (0.5 - 1.6 MHz) and FM band. (76 - 90 MHz) A signal is received and it is (3). It serves as the antenna pattern of AM band by the defogger pattern of a level stripe, and is (4). The frequency more than FM band is received by the antenna pattern extended perpendicularly.
[0009] (2) on this glass side (3) (4) Booster amplifier which let the input line of A, B, and C pass, respectively, and has arranged the signal from an antenna pattern on the same side (5) It inputs, compounds and amplifies by the booster amplifier, and is a cable (6). It lets it pass and an output signal X is taken out. Cable (6) It consists of the power supply line which supplies the coaxial cable which considers the shield of an output signal line as Grounding GND, and the power supply VPP of a booster amplifier.
[0010] defogger pattern (3) of the electrode arranged to the character type of KO on a glass side **** -- the side edge section -- choke coil (8) (9) Cable (7) It lets it pass and a power supply VDD and Grounding GND are supplied. (10) is the stabilization capacity of a power supply. Choke coil (8) (9) Capacity (10) is glass (1). It is equipped near the automobile rear with which it was equipped. Choke coil (8) (9) Defogger pattern (3) It is made the property that are the frequency of AM band and an impedance becomes high from power supplies VDD and GND, and is a defogger pattern (3). The signal of AM band is received by the antenna pattern as which it served. Defogger pattern to a booster amplifier (5) (3) The signal input from an antenna pattern as which it served is a defogger pattern (3). When it considers as the pattern of drawing 1 and right-and-left reversal, it can make with B and a similar input line from the point shown by D.
[0011] Drawing 2 is a reference-circuit diagram of a booster amplifier used for the glass antenna of this invention. The signal of a coil (11) and the filter by capacity (12), and AM band is the filter with which the signal of through and FM band prevents the signal of the input line B in drawing 1 . Compound with the signal of an input line A and it lets the input filter of FM band which connected the coil (15) between the middle terminal of the series connection of capacity (13) and (14), and grounding pass. The signal component of FM band was led to one gate of a double gate electric field effect TORANNJI star (18), it let the input filter of capacity (23), a coil (24), and AM band that consists of the series connection of resistance (25) pass, and the signal component of AM band is led to the base of a transistor (27). The gate bias of a transistor (18) pressures a power supply partially by resistance (16) and (17), and performs it, and the transistor (27) is connecting and carrying out bias of the resistance (26) between a collector and the base.
[0012] The source of a transistor (18) carries out parallel connection of the capacity (20) to resistance (19) between groundings, and the emitter of a transistor (27) is made grounding. The drain of a transistor (18) is connected with the collector of a transistor (27). The series connection of the coil (22) is carried out to resistance (21) as a load between power supplies. Each signal of FM band inputted into a transistor (18) and a transistor (27) and AM band is compounded and amplified with this amplifier that made a load (21) and (22) common and carried out parallel connection of a transistor (18) and the transistor (27).
[0013] The transistor (18) and the outputting point of (27) connected resistance (29) between an emitter and grounding, and it connected with the base of the transistor (28) of the emitter-follower which connected the collector with the power supply, and they have taken out the output signal X from the emitter-follower through capacity (30). Resistance (25) is a synthetic impedance with a coil (24), the base-current component of an alternating current signal was restricted,

and it was used for adjusting the signal gain of amplifier, and the coil (22) has chosen the impedance so that the amplification signal of FM band may be acquired. The amplification signal of FM band of the node of resistance (21) and a coil (22) is changed into the direct current signal which controls a transistor through the automatic gain control circuit which consists of the element of (31) - (41), and is inputted into the gate of another side of a double gate field-effect transistor (18). The gain of the signal of FM band is controlled by this feedback.

[0014] From the node of resistance (21) and a coil (22), the signal inputted through capacity (31) is amplified by (32) - (34), and is rectified by (35) - (38), reversal amplification is carried out by (39) - (41), and the direct current signal for control is made. The emitter of a transistor (33) connects grounding between power supplies, a collector connects resistance (34), and the base connects and carries out bias of the resistance (32) among collectors, and inputs a signal from (31).

[0015] The output of a transistor (33) lets capacity (35) pass, and serves as a signal of the bias point of diode (36), and it is rectified by diode (37) and capacity (38). It becomes the base potential of a transistor (39). The emitter of a transistor (39) connects grounding between power supplies, a collector connects resistance (40), and potential is stabilized by capacity (41). If an input signal amplitude to capacity (31) is large, it is rectified, the current included in the base of a transistor (39) will be large, and the voltage during resistance (40) will be large, and it will operate so that the gate of a transistor (18) and voltage between the sources may be made low and gain may be lowered. The resistance (44) connected to the power supply VPP is a voltage drop by the current which flows in a circuit, it is used in order to make supply voltage low, and it constitutes the power supply filter with a coil (43) and capacity (42).

[0016]

[Function] The glass antenna of this invention compounds the signal from two or more antenna patterns with the input filter or amplifier of a booster amplifier, as the element which constitutes the amplifier is communalized, an element number is lessened, change by leading about of the shell which miniaturizes a booster amplifier and was made to mount on the same glass side, and lead wire is removed, and a stable signal output is obtained. The composition of the shell compounds and amplifies the signal from two or more antenna patterns by the booster amplifier of a piece, and it was made to output from an end child, and a glass antenna is easy, and highly efficient-ization is attained.

[0017]

[Example] Drawing 3 is 2nd reference-circuit diagram of a booster amplifier used for the glass antenna of this invention. The signal of the input line A in drawing 1 let the filter of FM band which consists of the element of (45) - (48) pass, let the filter of AM band with which it goes into the base of (50) on the other hand, and the signal of an input line B consists of the element of (54) - (57) of two transistors by which the series connection was carried out pass, and is contained in a TORANNJI star's (59)'s base.

[0018] The filter of FM band carried out the series connection of resistance (45), capacity (46), and (47), the coil (48) is connected between the middle terminal of capacity (46) and (47), and grounding, and the filter of AM band carried out the series connection of a coil (54), capacity (55), and the resistance (56), and has connected capacity (57) between a coil (54), capacity (55), and resistance (56 A coil (48) attenuates the signal component of AM band in collaboration with capacity (46), and capacity (57) attenuates [coil] the signal component of FM band in collaboration with a coil (54). The input line of A and B, and transistor (50), The resistance between the bases of (59) (45) and (56) adjust the impedance to the base, and use it for setting up the gain of the signal of FM band and AM band appropriately.

[0019] (49) and (58) are resistance for the base biases of a transistor (50) and (59), respectively, and the in-series transistor of (50) and (51) and the transistor of (59) by which parallel connection was carried out are amplifying and compounding the input signal from A and B by making resistance (52) and a coil (53) into a common load. (60) - (62) corresponded to drawing 2 (28) - (30), and has taken out the output signal from the emitter-follower. The signal of the node of resistance (52) and a coil (53) goes into an automatic gain control circuit (63), and the output goes into the base of the transistor (51) by which a series connection is carried out to the transistor (50) which amplifies the signal of FM band, and controls the gain of the signal of FM band. It is used in order that the zener diode (65) which carried out the series connection to the supply line of a power supply VPP with the coil (66) may lower supply voltage by zener voltage, and (64) is stabilization capacity.

[0020] Drawing 4 is 3rd reference-circuit diagram of a booster amplifier used for the glass antenna of this invention. In the signal of AM band, the signal of through and FM band prevents the signal of the input line B in drawing 1 . The filter of FM band according to the element of (69) - (71) that the signal component of an unnecessary frequency band should be removed after compounding with the signal of an input line A with a filter with a coil (67) and letting a coil (68) pass for the composite signal, (78) It re-compounds through the filter of AM band by the element of - (81), and is putting into the base of a transistor (73). The filter of FM band carried out the series connection of capacity (69) and (70), and connected the coil (71) with the middle terminal of capacity (69) and (70) between groundings, and the filter of AM band carried out the series connection of capacity (78), a coil (79), and the resistance (80), and has connected

capacity (81) between a coil (79), the node of resistance (80), and grounding.
[0021] Between the power supplies to which the emitter of a transistor (73) was regulated by grounding, and the collector was regulated by the element of (82) - (86), resistance (75) was connected with the coil (74) and the resistance for bias (72) is connected between the base and a collector. A coil (68) and resistance (80) adjust the impedance to the base of a transistor (73) of the signal of FM band and AM band, respectively, and set up the gain of a coil (74) and the amplification signal which appears in the load of resistance (75).
[0022] The output signal X is directly taken out from this amplifier through capacity (76). The capacity (77) connected between a coil (74), the node of resistance (75), and grounding is used for improving the frequency characteristic of the gain of amplifier. A regulator connects the collector of a transistor (83) with a power supply VPP through a coil (86), and the base pressures partially and carries out bias of during a power supply and grounding by resistance (85) and zener diode (84), and attaches and constitutes stabilization capacity (82) in the emitter. Bias of the base is carried out by zener voltage, and since it is outputting by the emitter-follower, a power supply is regulated to the zener voltage-base and the voltage between emitters.
[0023] Drawing 5 is the 1st example of the booster amplifier used for the glass antenna of this invention. Respectively, it let the filter of FM band according the signal of the input lines A and C in drawing 1 to the element of (87) - (89) and (94) - (96) pass, it was put into the base of the transistor (91) by which parallel connection was carried out, and (98), it amplified with the amplifier which uses a common load as resistance (92) and a coil (93), and the output signal X is taken out through capacity (99). the capacity to which the series connection of the filter of FM band was carried out -- a coil (89) and (96) are connected between each middle node and groundings of each (87), (88), (94), and (95) The base of a transistor (91) and (98), the resistance between collectors (90), and (97) are the resistance (92) which is an object for bias and serves as a load, the node of a coil (93), and the capacity (100) during grounding. It uses for improving the gain of the amplifier of FM band. Coil linked to the power supply VPP (102) Capacity (101) It is a power supply filter. To drawing 1 , it is (2). (4) The shown signal of a horizontal and vertical antenna pattern is compounded and amplified, and the receiving sensitivity of a glass antenna is raised.
[0024] Drawing 6 is the 2nd example of the booster amplifier used for the glass antenna of this invention. It is the signal of input lines A and C, respectively (103) - (106) The filter (113) of FM band by the element, and - (115) It compounds through the filter of the frequency more than FM band by the element, and is a transistor (108). It is putting into the base. transistor (108) an emitter -- grounding and a collector -- coil (109) ** (110) a series connection -- carrying out -- resistance (107) for bias to between the base and a collector It has connected.
[0025] The filter of FM band is capacity (104) (114). Coil (103) A series connection is carried out and it is a coil (106) between capacity (104), the middle terminal of (105), and grounding. Connecting, the filter of the frequency more than FM band is capacity (113). It is a coil (115) between the middle terminal of a series connection, and grounding. It has connected. (105) coil (103) the frequency of FM band -- transistor (108) Coil (109) which adjusts the impedance to the base and serves as a load ** (110) Capacity (112) between a middle terminal and grounding It is used for adjusting the frequency characteristic of the signal gain of amplifier.
[0026] An output signal X is capacity (111) from amplifier. It has minded and taken out. Coil linked to the power supply VPP (117) Capacity (116) It is a power supply filter. The signal of the frequency band of more than FM band, for example, television, is inputted from C, and it is a coil (110) with FM band. It considers as the main loads and is a coil (109) with TV band. It is made for a load to move.
[0027]
[Effect of the Invention] Its receiving property improves while compounding the signal from two or more antenna patterns with the input filter or amplifier of a booster amplifier arranged on the same glass side, making brief processing of the signal from the shell it was made to output from an end child, and two or more antenna patterns and the glass antenna of this invention raising reliability.

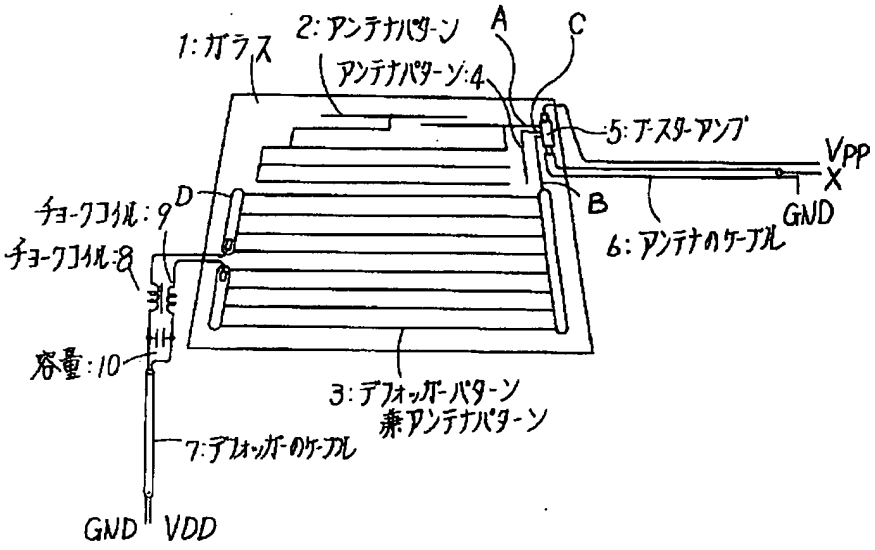
[Translation done.]

* NOTICES *

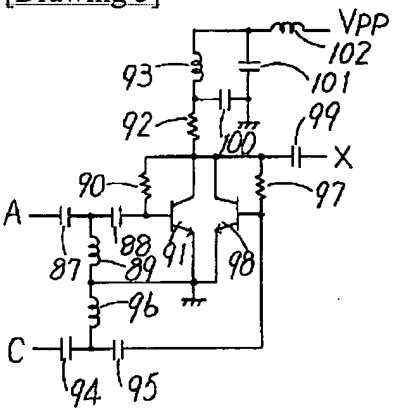
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

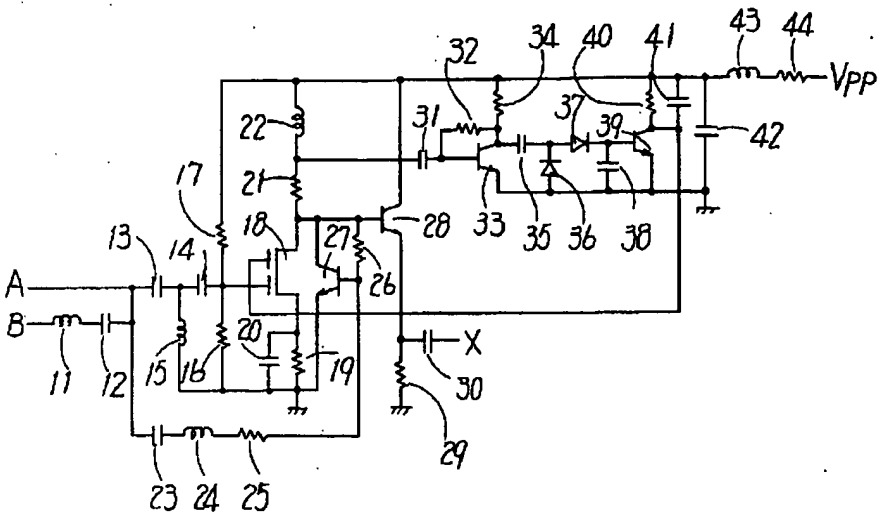
[Drawing 1]



[Drawing 5]



[Drawing 2]



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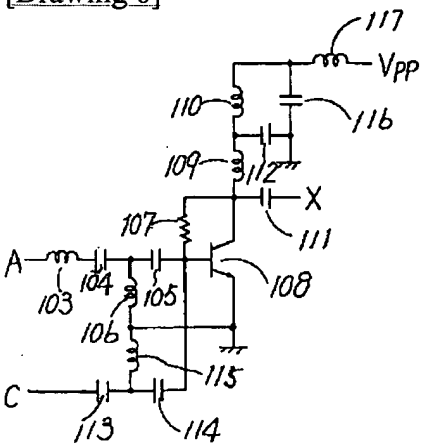

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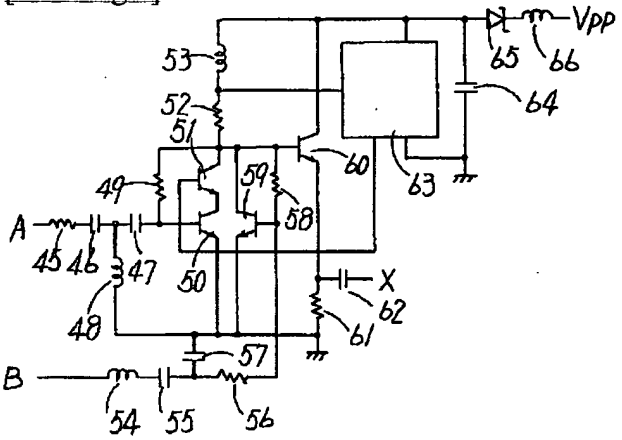

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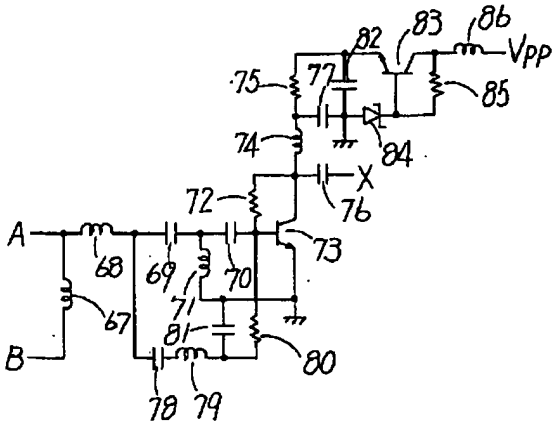
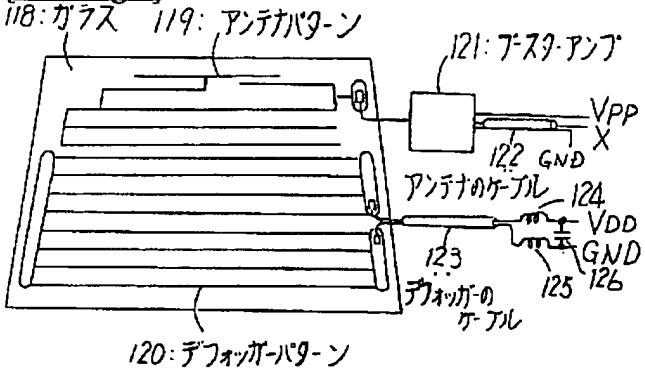
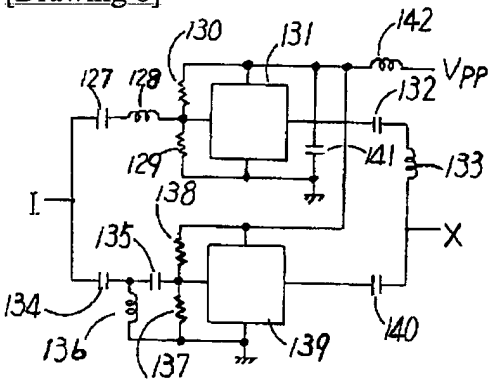


[Drawing 7]



[Drawing 8]



[Translation done.]